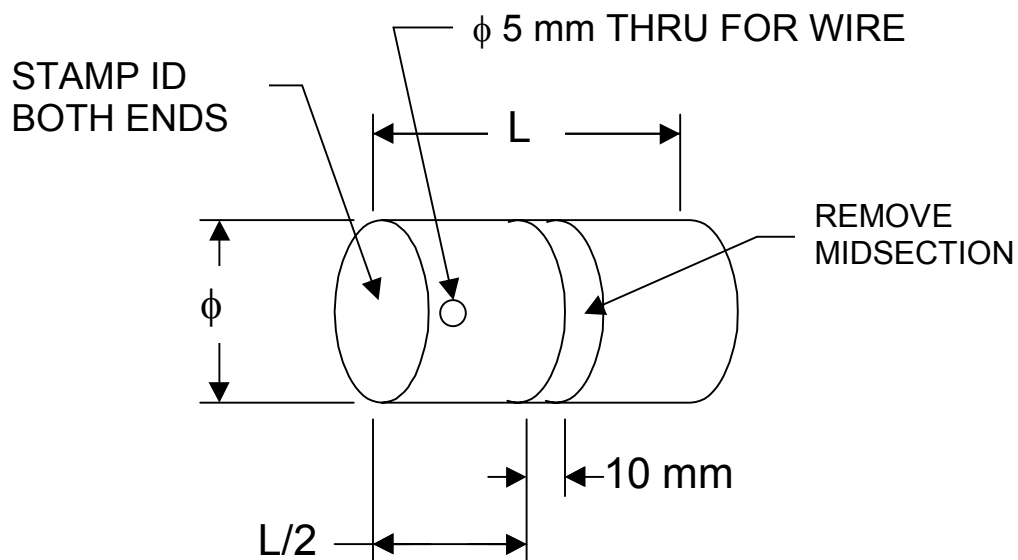
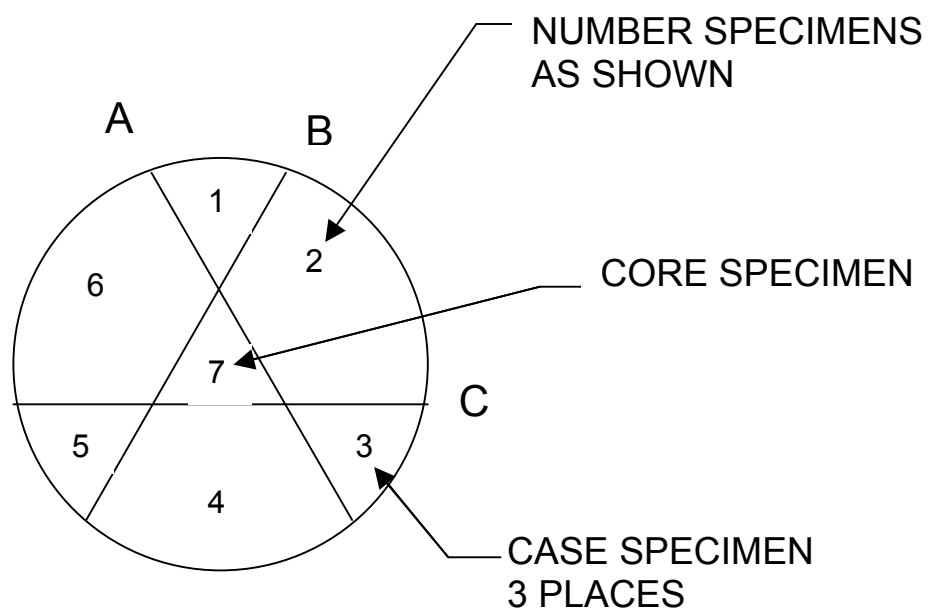


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<div>1. Scope</div> <div>1.1 This procedure covers preparation of representative test coupons for use in monitoring heat treatment of carburized gears.</div> <div>2. Referenced Documents</div> <div>2.1 ASTM E 3 Standard Practice for Preparation of Metallographic Specimens.</div> <div>3. Terminology</div> <div>3.1 Representative test coupon- A coupon designed to represent the cooling rate of the teeth of a particular carburized and hardened gear.</div> <div>4. Representative Test Coupon</div> <div>4.1 Raw material- The coupon shall be made from the same heat of steel as the gears it represents.</div> <div>4.2 Geometry- Diameter shall be six times the module (<math>6 \times m_n</math>) and length shall be twice the diameter.</div> <div>4.3 Machining- Coupon shall be lathe turned to <math>Ra = 3.2 \mu m</math> maximum surface roughness. Stock removal shall be <math>0.2 \times m_n</math> minimum.</div> <div>4.4 Traceability- Coupon shall be stamped with an identification number that is traceable to the gear it represents and the heat of steel.</div> <div>4.5 Heat treatment- The coupon shall be wired to a gear and accompany the gears through all heat treatment including, but not limited to, normalizing, carburizing, quenching, tempering, and post carburize cold treatment.</div> <div>4.6 Cleaning- After heat treatment, the coupon shall be washed with soap and water, rinsed with methanol, and dried. Grit blasting or other cleaning methods shall not be used.</div> <div>5. Cutting</div> <div>5.1 Cutting machine- All cutting shall be done with a water-cooled, abrasive, cut-off wheel. Cut sections shall be nital etched to demonstrate that they have not been tempered.</div> <div>5.2 Cross-section removal- A 10 mm thick transverse section shall be removed from the midsection of the coupon by cutting in two planes perpendicular to the axis of the coupon as shown in Figure 1.</div> <div>5.3 Case/core specimens- The cross section shall be cut along the lines marked A, B, and C in Figure 2 to remove one core specimen and three case specimens.</div> <div>6. Metallurgical Mounts</div> <div>6.1 Mounting- The core specimen and case specimens shall be mounted in phenolic resin mounts in accordance with ASTM E 3.</div> <div>6.2 Traceability- All mounts shall be etched with the identification number of the coupon.</div> <div>6.3 Grinding and polishing- The core specimen and case specimens shall be ground and polished in accordance with ASTM E 3.</div>				

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**FIGURE 1**



**FIGURE 2**